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Fishing Creek Reservoir Chester and Lancaster Counties, South Carolina

National Eutrophication Survey, Corvallis, Oreg

Prepared for

Corvallis Environmental Research Lab, Oreg

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NATIONAL EUTROPHICATION SURVEY

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REPORT
ON
FISHING CREEK RESERVOIR
CHESTER AND LANCASTER COUNTIES
SOUTH CAROLINA
EPA REGION IV
WORKING PAPER No. 430

WITH THE COOPERATION OF THE
SOUTH CAROLINA DEPARTMENT OF HEALTH AND
ENVIRONMENTAL CONTROL
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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the South Carolina Department of Health and Environmental Control for professional involvement, to the South Carolina National Guard for conducting the tributary sampling phase of the Survey, and to those South Carolina wastewater treatment plant operators who voluntarily provided effluent samples and flow data.

The staff of the South Carolina Bureau of Wastewater and Stream Quality Control provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

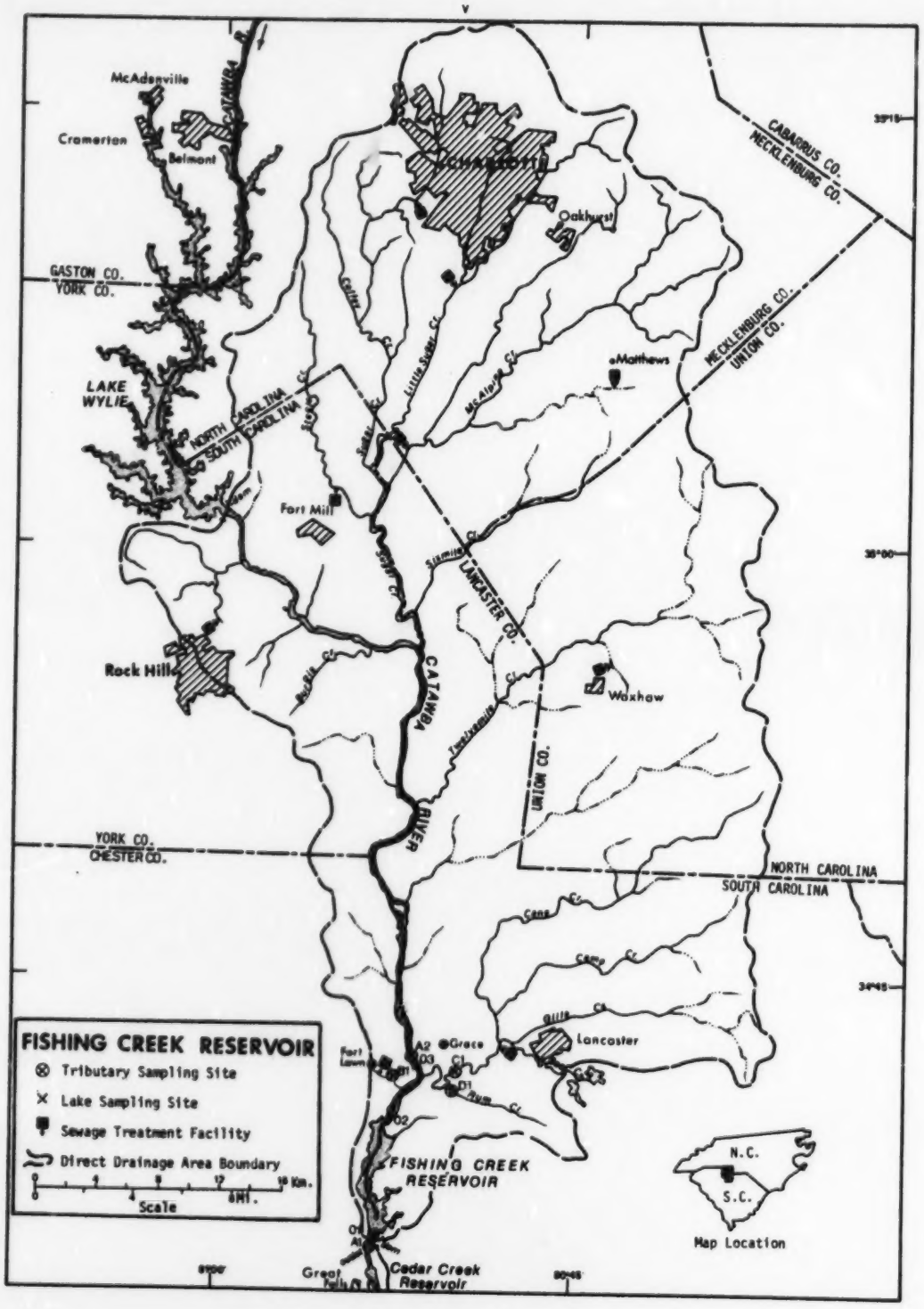
Major General Robert L. McCrady, the Adjutant General of South Carolina, and Project Officer Lt. Colonel John P. DuPre (Retired), who directed the volunteer efforts of the South Carolina National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF SOUTH CAROLINA

NAME	COUNTY
Clark Hill	Abbeville, McCormick, SC; Columbia, Elbert, Lincoln, McDuffie, Wilks, GA
Fishing Creek	Chester, Lancaster
Greenwood	Greenwood, Laurens, Newberry
Hartwell	Anderson, Oconee, Pickens, SC; Franklin, Hart, Stephens, GA
Keowee	Oconee, Pickens
Marion	Berkeley, Calhoun, Claredon, Orangeburg, Sumter
Moultrie	Berkeley
Murray	Lexington, Newberry, Richland, Saluda
Robinson	Chesterfield, Darlington
Saluda	Greenville, Pickens
Secession	Abbeville, Anderson
Wateree	Fairfield, Kershaw, Lancaster
William C. Bowen	Spartanburg
Wylie	York, SC; Gaston, Mecklenburg, NC


McAdenville
Cramerton
Belmont
CHARLOTTE
Oakhurst
CABARRUS CO.
MECKLENBURG CO.
GASTON CO.
YORK CO.
LAKE WYLIE
NORTH CAROLINA
SOUTH CAROLINA
Matthews
MECKLENBURG CO.
UNION CO.
Fort Mill
LANCASTER CO.
Rock Hills
CATAWBA RIVER
Waxhaw
UNION CO.
YORK CO.
CHESTER CO.
NORTH CAROLINA
SOUTH CAROLINA
Lancaster
Grace
FISHING CREEK RESERVOIR
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Direct Drainage Area Boundary
Scale
N.C.
S.C.
Map Location
Great Falls
Cedar Creek Reservoir

FISHING CREEK RESERVOIR

STORET NO. 4503

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate Fishing Creek Reservoir is eutrophic. However, since the mean hydraulic retention time of this water body is a very short six days, it more closely resembles a slow-moving river, and the term "over-enriched" may be a better description of the reservoir.

Fishing Creek Reservoir ranked tenth in overall trophic quality when the 13 South Carolina lakes sampled in 1973 were compared using a combination of six parameters*. All of the other lakes had less median total phosphorus, dissolved orthophosphorus, and inorganic nitrogen; all of the others had greater mean Secchi disc transparency; but only one lake had less mean chlorophyll a. However, the low concentrations of chlorophyll a, the lack of transparency (the mean Secchi disc depth was less than 1/2 meter), and the high concentrations of nutrients indicate primary productivity was light-limited rather than nutrient-limited. Survey limnologists commented on the turbid water at each of the sampling stations and times.

B. Rate-Limiting Nutrient:

The algal assay results indicate nitrogen limitation at the time the sample was collected (09/22/73).

The reservoir data indicate phosphorus limitation in April and

* See Appendix A.

nitrogen limitation in July and September. However, primary productivity probably is light-limited rather than nutrient-limited.

C. Nutrient Controllability:

1. Point sources--The phosphorus contributions of point sources accounted for an estimated 74.4% of the total load reaching the reservoir during the sampling year. Three Charlotte, NC metropolitan area wastewater treatment plants contributed 46.6%; Rock Hill, SC contributed 13.6%; and the eight remaining plants collectively added 4.6% of the total load. The indirect municipal sources discharging in the upstream Lake Wylie† drainage contributed an estimated 9.6% of the load.

The phosphorus loading of 53.03 g/m^2 measured during the sampling year is more than 16 times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading (see page 15). However, the mean hydraulic retention time of Fishing Creek Reservoir is a very short six days, and it is not likely that Vollenweider's model applies.

It is calculated that even complete removal of phosphorus at the direct and indirect municipal point sources included in this report would still leave a loading of 13.6 g/m^2/year; and in view of the probability that the primary productivity of the reservoir is light-limited much of the time, it is not considered likely

† Working Paper No. 441.

that point-source phosphorus control would result in a significant improvement in the trophic condition of Fishing Creek Reservoir. However, point-source control would reduce the phosphorus loading to downstream Wateree Lake* and Lake Marion**.

2. Non-point sources--The Catawba River phosphorus load amounted to 19.8% of the total. The other three gaged tributaries collectively contributed 5.4% of the total load, and the minor tributaries and immediate drainage contributed an estimated 0.3%.

The phosphorus export rate of Cane Creek was much higher than the rates of the other tributaries (see page 14). This high rate may have resulted in part from underestimation of the phosphorus load from the Lancaster wastewater treatment plant and in part from the individually small loads contributed by privately-owned domestic facilities in that drainage.

* Working Paper No. 440.
** Working Paper No. 434.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS†

A. Lake Morphometry††:

1. Surface area: 13.64 kilometers².
2. Mean depth: 5.4 meters.
3. Maximum depth: 27.3 meters.
4. Volume: 73.627 x 10^6 m^3.
5. Mean hydraulic retention time: 6 days.

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Catawba River	9,375.8	127.620
Unnamed Creek B-1	4.8	0.054
Cane Creek	388.5	4.440
Rum Creek	24.3	0.270
Minor tributaries & immediate drainage -	60.9	0.690
Totals	9,854.3	133.074

2. Outlet -

Catawba River	9,867.9	133.070

C. Precipitation***:

1. Year of sampling: 124.6 centimeters.
2. Mean annual: 111.0 centimeters.

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† Table of metric conversions--Appendix B.
†† Mast, 1974.
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Includes area of lake.
*** See Working Paper No. 175.

III. LAKE WATER QUALITY SUMMARY

Fishing Creek Reservoir was sampled three times during the open-water season of 1973 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at three stations on the reservoir (see map, page v). During each visit, a single depth-integrated (4.6 m or near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the last visit, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 11.0 meters at station 1, 4.9 meters at station 2, and 4.6 meters at station 3.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR FISHING CREEK RESERVOIR
STORET CODE 4503

PARAMETER	1ST SAMPLING (4/ 2/73) 3 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (7/ 6/73) 3 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (9/22/73) 3 SITES RANGE	MEAN	MEDIAN
TEMP (C)	15.2 - 15.6	15.3	15.2	27.3 - 30.3	28.0	27.7	26.3 - 27.7	26.9	26.9
DISS OXY (MG/L)	7.6 - 8.2	7.8	7.8	4.8 - 9.5	6.1	5.9	4.8 - 7.0	5.8	5.6
CNDCTVY (MCROMO)	53. - 60.	56.	55.	100. - 110.	110.	110.	115. - 131.	124.	124.
PH (STAND UNITS)	7.1 - 7.3	7.2	7.2	6.6 - 8.4	7.0	6.8	6.4 - 7.4	6.8	6.6
TOT ALK (MG/L)	10. - 12.	10.	10.	16. - 23.	20.	20.	20. - 27.	23.	22.
TOT P (MG/L)	0.133 - 0.294	0.178	0.151	0.085 - 0.173	0.129	0.133	0.099 - 0.144	0.116	0.113
ORTHO P (MG/L)	0.024 - 0.033	0.029	0.030	0.038 - 0.082	0.060	0.063	0.051 - 0.082	0.063	0.060
NO2+NO3 (MG/L)	0.290 - 0.350	0.316	0.320	0.170 - 0.430	0.369	0.400	0.180 - 0.290	0.226	0.230
AMMONIA (MG/L)	0.170 - 0.310	0.241	0.220	0.080 - 0.270	0.181	0.220	0.040 - 0.180	0.115	0.115
KJEL N (MG/L)	0.480 - 1.300	0.618	0.600	0.300 - 0.800	0.464	0.480	0.400 - 1.200	0.637	0.680
INORG N (MG/L)	0.480 - 0.680	0.557	0.570	0.250 - 0.670	0.550	0.630	0.200 - 0.420	0.341	0.340
TOTAL N (MG/L)	0.760 - 1.590	0.935	0.890	0.470 - 1.210	0.833	0.830	0.610 - 1.420	0.884	0.840
CHLRPYL A (UG/L)	2.3 - 2.5	2.4	2.5	1.9 - 4.5	3.1	2.8	2.0 - 4.5	2.9	2.3
SECCHI (METERS)	0.1 - 0.1	0.1	0.1	0.3 - 0.8	0.5	0.5	0.7 - 0.8	0.7	0.7

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
04/02/73	1. Cryptomonas sp.	115
	2. Melosira sp.	86
	3. Aphanizomenon sp.	57
	4. Nitzschia sp.	29
	Total	287
07/06/73	1. Melosira sp.	119
	2. Flagellates	92
	3. Nitzschia sp.	79
	4. Merismopedia sp.	39
	5. Scenedesmus sp.	39
	Other genera	287
	Total	655
09/22/73	1. Scenedesmus sp.	168
	2. Melosira sp.	105
	3. Cyclotella sp.	96
	4. Nitzschia sp.	40
	5. Cryptomonas sp.	40
	Other genera	202
	Total	651

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
04/02/73	1	2.3
	2	2.5
	3	2.5
07/06/73	1	4.5
	2	2.8
	3	1.9
09/22/73	1	4.5
	2	2.3
	3	2.0

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.037	0.264	6.5
0.010 P	0.047	0.264	8.0
0.020 P	0.057	0.264	7.4
0.050 P	0.087	0.264	7.8
0.025 P + 0.5 N	0.062	0.764	16.9
0.050 P + 1.0 N	0.087	1.264	29.2
1.0 N	0.037	1.264	11.6

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity of Fishing Creek Reservoir was high at the time the sample was collected (09/22/73). The lack of significant increase in yields with increases in phosphorus, as well as the significant increase in yield when nitrogen alone was added, indicates nitrogen limitation.

The reservoir data indicate phosphorus limitation in April and nitrogen limitation in July and September (the mean inorganic nitrogen/orthophosphorus ratios were 19/1, 9/1, and 5/1, respectively). However, primary productivity in the reservoir probably is light-limited rather than nutrient-limited.

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the South Carolina National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff month of January when two samples were collected. Sampling was begun in February, 1973, and was completed in February, 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the South Carolina District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loads shown are those measured minus point-source loads, if any.

Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the nutrient loads in Rum Creek at station D-1, in kg/km^2/year, and multiplying by the ZZ area in km^2.

The indirect municipal point-source loads leaving upstream Lake Wylie** were calculated by multiplying the nutrient loads leaving that lake (176,385 kg P and 2,753,045 kg N) by the fractions of the total nutrient loads contributed by the municipal point sources (0.395

* See Working Paper No. 175.
** Working Paper No. 441.

for P and 0.077 for N).

The operator of the Rock Hill wastewater treatment plant provided monthly effluent samples and corresponding flow data. The operators of the other listed municipal plants did not participate in the Survey, and nutrient loads were estimated at 1.134 kg P and 3.401 kg N/capita/year.

A. Waste Sources:

1. Known South Carolina municipal† -

Name	Pop. Served	Treatment	Mean Flow (m^3/d)	Receiving Water
Fort Lawn*	210	stab. pond	79.5	Unnamed Creek B-1
Fort Mill				
Jackson*	3,637	stab. pond	734.3	Steele Creek
#2	744	Imhoff	499.6	Steele Creek
#3	154	Imhoff	34.1	Steele Creek
Lancaster	22,000	act. sludge	8,327.0	Cane Creek
Rock Hill*	33,000	act. sludge	41,320.8	Manchester Creek

In addition, there are 14 privately-owned domestic waste treatment facilities with a combined flow of 870 m^3/day; the nutrient impact of these small facilities is not known but probably is relatively insignificant.

2. Known North Carolina municipal** -

Name	Pop. Served	Treatment	Mean Flow (m^3/d)	Receiving Water
Charlotte				
Irwin Creek	88,700	act. sludge	37,698.6	Irwin Creek/ Sugar Creek
McAlpine Creek*	63,380	act. sludge	40,688.8	McAlpine Creek
Sugar Creek	145,180	act. sludge	55,526.0	Little Sugar Creek
Matthews	1,350	cont. stab.	548.8	Trib./McAlpine Creek
Mecklenburg County	470	ext. aer.	177.9	Steele Creek
Waxhaw	550	Imhoff	68.1	Trib./Twelve Mile Creek.

† Foley, 1976; Anonymous, 1971.
* Over 25% of the waste load is industrial.
** Anonymous, 1976.

Domestic waste treatment facilities serving six schools and a nursing home (combined flow of 206 m^3/day) are located in the Charlotte metropolitan area. The nutrient significance of these small sources probably is minimal.

3. Indirect municipal - Fourteen municipal wastewater treatment plants discharge in the drainage of upstream Lake Wylie. A portion of the nutrients contributed by these plants reaches Fishing Creek Reservoir via the Lake Wylie outlet and the Catawba River.

4. South Carolina industrial* - Four industrial waste treatment facilities of possible nutrient significance are located in the South Carolina portion of the drainage (combined design flow of 420 m^3/day). The nutrient impact of these facilities is not known.

5. North Carolina industrial** - Two industrial waste treatment facilities of possible nutrient significance (chrome-plating and dairy) are located in the Charlotte metropolitan area. However, the combined flow of these facilities is only 61 m^3/day, and the nutrient impact probably is relatively insignificant.

* Foley, op. cit.
** Anonymous, 1976.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
Catawba River	143,335	19.8
Unnamed Creek B-1	30	<0.1
Cane Creek	38,320	5.3
Rum Creek	815	0.1
b. Minor tributaries & immediate drainage (non-point load) -	2,070	0.3
c. Known municipal STP's -		
Charlotte (3 plants)	337,095	46.6
Fort Lawn	240	<0.1
Fort Mill (3 plants)	5,145	0.7
Lancaster	24,950	3.4
Matthews	1,530	0.2
Mecklenburg County	595	<0.1
Rock Hill	98,710	13.6
Waxhaw	625	0.1
Indirect sources	69,670	9.6
d. Septic tanks - Unknown	?	-
e. Industrial - Probably not significant		-
f. Direct precipitation* -	240	<0.1
Total	723,310	100.0

2. Outputs -

Lake outlet - Catawba River 662,045

3. Net annual P accumulation - 61,265 kg.

* See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/yr	% of total
a. Tributaries (non-point load) -		
Catawba River	4,778,135	71.9
Unnamed Creek B-1	1,855	<0.1
Cane Creek	228,805	3.4
Rum Creek	8,655	0.1
b. Minor tributaries & immediate drainage (non-point load) -	21,680	0.3
c. Known municipal STP's -		
Charlotte (3 plants)	1,010,980	15.2
Fort Lawn	715	<0.1
Fort Mill (3 plants)	15,425	0.2
Lancaster	74,820	1.1
Matthews	4,590	<0.1
Mecklenburg County	1,600	<0.1
Rock Hill	273,335	4.1
Waxhaw	1,870	<0.1
Indirect sources	211,985	3.2
d. Septic tanks - Unknown	?	-
e. Industrial - Probably not significant		-
f. Direct precipitation* -	14,725	0.2
Total	6,649,175	100.0

2. Outputs -

Lake outlet - Catawba River 6,736,480

3. Net annual N loss - 87,305 kg.

* See Working Paper No. 175.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km²/yr	kg N/km²/yr
Catawba River	15	510
Unnamed Creek B-1	6	386
Cane Creek	99	589
Rum Creek	34	356

E. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	53.03	4.49	487.5	loss*

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Fishing Creek Reservoir:

"Dangerous" (eutrophic loading)	3.20
"Permissible" (oligotrophic loading)	1.60

* There was an apparent loss of nitrogen during the sampling year. This may have been due to nitrogen fixation in the reservoir, solubilization of previously sedimented nitrogen, recharge with nitrogen-rich ground water, unknown point sources discharging directly to the reservoir, or (probably) insufficient outlet sampling in relation to the very short hydraulic retention time of the reservoir. Whatever the cause, a similar nitrogen loss has occurred at Shagawa Lake, Minnesota, which has been intensively studied by EPA's former National Eutrophication and Lake Restoration Branch (Malueg, et al., 1975).

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VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
4503	FISHING CREEK RESERVOIR	0.143	0.535	483.000	2.811	10.200	0.051
4504	LAKE GREENWOOD	0.061	0.470	463.917	8.150	15.000	0.011
4505	LAKE HARTWELL	0.013	0.130	422.000	6.157	15.000	0.004
4506	LAKE MARION	0.055	0.280	470.176	8.728	14.900	0.010
4507	LAKE MURRAY	0.024	0.260	424.905	6.478	15.000	0.007
4508	LAKE ROBINSON	0.014	0.260	458.778	8.611	14.000	0.005
4510	LAKE WATEREE	0.094	0.450	475.667	8.408	14.100	0.034
4511	LAKE WYLIE	0.045	0.380	462.222	5.422	14.800	0.013
4512	LAKE MOULTRIE	0.026	0.200	455.36	8.800	11.200	0.006
4513	LAKE KEOWEE	0.008	0.170	371.750	2.433	15.000	0.003
4514	LAKE SECESSION	0.057	0.355	462.778	10.722	15.000	0.006
4515	SALUDA LAKE	0.046	0.230	476.833	1.517	10.800	0.006
4516	LAKE WILLIAM C. BOWEN	0.022	0.360	459.889	3.911	15.000	0.007

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
4503	FISHING CREEK RESERVOIR	0 (0)	0 (0)	0 (0)	92 (11)	100 (12)	0 (0)	192
4504	LAKE GREENWOOD	17 (2)	8 (1)	33 (4)	42 (5)	21 (0)	25 (3)	146
4505	LAKE HARTWELL	92 (11)	100 (12)	92 (11)	58 (7)	21 (0)	92 (11)	455
4506	LAKE MARION	33 (4)	50 (6)	25 (3)	17 (2)	50 (6)	33 (4)	208
4507	LAKE MURRAY	67 (8)	62 (7)	83 (10)	50 (6)	21 (0)	46 (5)	329
4508	LAKE ROBINSON	83 (10)	62 (7)	67 (8)	25 (3)	75 (9)	83 (10)	395
4510	LAKE WATEREE	8 (1)	17 (2)	17 (2)	33 (4)	67 (8)	8 (1)	150
4511	LAKE WYLIE	50 (6)	25 (3)	50 (6)	67 (8)	58 (7)	17 (2)	267
4512	LAKE MOULTRIE	58 (7)	83 (10)	75 (9)	8 (1)	83 (10)	71 (8)	378
4513	LAKE KEOWEE	100 (12)	92 (11)	100 (12)	83 (10)	21 (0)	100 (12)	496
4514	LAKE SECESSION	25 (3)	42 (5)	42 (5)	0 (0)	21 (0)	58 (7)	188
4515	SALUDA LAKE	42 (5)	75 (9)	8 (1)	100 (12)	92 (11)	71 (8)	388
4516	LAKE WILLIAM C. BOWEN	75 (9)	33 (4)	58 (7)	75 (9)	21 (0)	46 (5)	308

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	4513	LAKE KEOWEE	496
2	4505	LAKE HARTWELL	455
3	4508	LAKE ROBINSON	395
4	4515	SALUDA LAKE	388
5	4512	LAKE MOULTRIE	378
6	4507	LAKE MURRAY	329
7	4516	LAKE WILLIAM C. BOWEN	308
8	4511	LAKE WYLIE	267
9	4506	LAKE MARION	208
10	4503	FISHING CREEK RESERVOIR	192
11	4514	LAKE SECESSION	188
12	4510	LAKE MATEREE	150
13	4504	LAKE GREENWOOD	146

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR SOUTH CAROLINA 04/27/76

LAKE CODE 4503 FISHING CREEK RESERVOIR

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 9867.9

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
4503A1	9867.9	169.64	183.77	191.97	185.47	124.68	111.96	97.54	104.04	102.35	99.24	111.96	118.46	133.07
4503A2	9375.8	163.67	185.48	194.25	174.43	116.95	100.24	95.43	102.51	90.90	84.95	109.38	117.80	127.62
4503B1	4.4	0.085	0.113	0.113	0.085	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.057	0.054
4503C1	388.5	6.68	8.83	9.91	6.54	2.66	2.04	2.78	2.83	1.98	2.29	2.94	4.02	4.44
4503D1	24.3	0.42	0.54	0.62	0.40	0.17	0.11	0.17	0.17	0.11	0.14	0.17	0.25	0.27
4503ZZ	60.9	1.05	1.39	1.56	1.02	0.42	0.31	0.42	0.45	0.31	0.37	0.45	0.62	0.69

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 9867.9
SUM OF SUB-DRAINAGE AREAS = 9854.2
TOTAL FLOW IN = 1601.73
TOTAL FLOW OUT = 1601.09

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4503A1	2	73	288.832	18	139.036				
	3	73	345.465	10	382.277				
	4	73	300.158	8	761.723				
	5	73	224.553	22	279.770				
	6	73	256.551	10	168.768				
	7	73	159.707	15	63.713				
	8	73	143.850	12	62.588				
	9	73	137.337	20	212.943				
	10	73	69.659	21	8.495				
	11	73	85.517	10	127.426				
	12	73	126.293	19	190.806				
	1	74	223.137	13	227.667	31	254.568		
	2	74	282.602	19	283.168				
4503A2	2	73	271.842	18	120.063				
	3	73	342.634	10	308.654				
	4	73	263.913	8	693.763				
	5	73	225.119	22	200.766				
	6	73	238.428	10	233.048				
	7	73	156.309	15	82.968				
	8	73	140.452	12	73.057				
	9	73	142.717	20	130.824				
	10	73	67.960	21	29.733				
	11	73	81.553	10	126.293				
	12	73	122.895	19	156.592				
	1	74	216.058	13	176.131	31	253.153		
	2	74	267.594	19	288.832				

TRIBUTARY FLOW INFORMATION FOR SOUTH CAROLINA 04/27/76

LAKE CODE 4503 FISHING CREEK RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
450381	2	73	0.198	18	0.142				
	3	73	0.085	10	0.311				
	4	73	0.311	8	0.623				
	5	73	0.028	22	0.057				
	6	73	0.170	10	0.142				
	7	73	0.028	15	0.028				
	8	73	0.028	12	0.028				
	9	73	0.028	20	0.028				
	10	73	0.028	21	0.028				
	11	73	0.028	10	0.028				
	12	73	0.028	19	0.113				
	1	74	0.057	13	0.142	31	0.198		
	2	74	0.142	19	0.085				
4503C1	2	73	16.141	18	12.035				
	3	73	6.371	10	25.485				
	4	73	25.485	8	42.475				
	5	73	2.152	22	1.926				
	6	73	12.743	10	11.468				
	7	73	0.425	15	1.274				
	8	73	0.425	12	1.218				
	9	73	0.396	20	1.274				
	10	73	2.973	21	1.076				
	11	73	1.274	10	1.133				
	12	73	3.171	19	2.549				
	1	74	8.495	13	2.690	31	8.495		
	2	74	11.044	19	6.796				
450301	2	73	1.019	18	0.765				
	3	73	0.396	10	1.586				
	4	73	1.586	8	4.644				
	5	73	0.142	22	0.113				
	6	73	0.793	10	0.708				
	7	73	0.057	15	0.085				
	8	73	0.028	12	0.057				
	9	73	0.028	20	0.085				
	10	73	0.170	21	0.057				
	11	73	0.085	10	0.057				
	12	73	0.198	19	0.170				
	1	74	0.538	13	0.227	31	0.538		
	2	74	0.680	19	0.425				
4503ZZ	2	73	2.520	18	1.897				
	3	73	0.991	10	3.993				
	4	73	3.964	8	11.638				
	5	73	0.340	22	0.340				
	6	73	1.982	10	1.784				
	7	73	0.142	15	0.198				
	8	73	0.028	12	0.170				
	9	73	0.028	20	0.198				
	10	73	0.453	21	0.170				
	11	73	0.198	10	0.198				
	12	73	0.510	19	0.396				
	1	74	1.331	13	0.425	31	1.331		
	2	74	1.727	19	1.076				

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 76/04/27

27<

450301
34 36 00.0 080 53 25.0 3
FISHING CREEK RESERVOIR
45023 SOUTH CAROLINA
030891

11EPALES 2111202
0040 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/04/02	08 30	0000	15.6		2	60	7.10	10K	0.310	1.300	0.290	0.033
	08 30	0006		7.8		53	7.30	10K	0.290	0.700	0.300	0.031
	08 30	0015	15.6	7.6		53	7.10	10K	0.280	0.600	0.290	0.028
	08 30	0025	15.6	7.6		53	7.10	10K	0.280	0.600	0.290	0.028
	08 30	0036	15.5	7.6		53	7.10	10K	0.270	0.600	0.320	0.030
73/07/06	16 00	0000	30.3		30	105	8.40	20	0.080	0.300	0.170	0.038
	16 00	0006	29.5	9.5		100	7.50	19	0.090	0.400	0.210	0.050
	16 00	0015	27.9	5.2		100	6.70	22	0.230	0.300	0.410	0.063
	16 00	0025	27.5	4.8		102	6.70	23	0.220	0.400	0.420	0.082
	16 00	0034	27.3	4.8		102	6.70	21	0.230	0.400	0.430	0.066
73/09/22	15 10	0000	27.2		32	129	7.40	20	0.040	1.200	0.220	0.050
	15 10	0005	27.0	6.4		130	6.60	21	0.100	0.600	0.290	0.070
	15 10	0015	26.3	5.0		120	6.60	20	0.150	0.600	0.240	0.057
	15 10	0025	26.3	4.8		123	6.60	22	0.180	0.600	0.240	0.055

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/04/02	08 30	0000	0.153	2.3
	08 30	0006	0.294	
	08 30	0015	0.184	
	08 30	0025	0.191	
	08 30	0036	0.259	
73/07/06	16 00	0000	0.108	4.5
	16 00	0006	0.114	
	16 00	0015	0.133	
	16 00	0025	0.146	
	16 00	0034	0.146	
73/09/22	15 10	0000	0.144	4.5
	15 10	0005	0.113	
	15 10	0015	0.104	
	15 10	0025	0.113	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/04/27

450302
34 40 13.0 080 53 06.0 3
FISHING CREEK RESERVOIR
45057 SOUTH CAROLINA
030891

11EPALES 2111202
0017 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/04/02	09 00	0000	15.2		2	60	7.30	11	0.210	0.600	0.330	0.032
	09 00	0006	15.2	8.2		55	7.30	10K	0.170	0.500	0.310	0.024
	09 00	0013	15.2	8.0		55	7.30	10	0.190	0.500	0.320	0.024
73/07/07	09 35	0000	27.5		18	115	6.80	16	0.140	0.400	0.390	0.057
	09 35	0006	27.5	6.2		110	6.80	17	0.140	0.600	0.390	0.051
	09 35	0016	27.3	6.2		116	6.60	17	0.130	0.500	0.400	0.047
73/09/22	15 30	0000	27.7	5.6	28	125	6.80	25	0.130	0.700	0.180	0.051
	15 30	0005	26.4	5.0		131	6.40	27	0.170	0.600	0.190	0.062

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/04/02	09 00	0000	0.142	2.5
	09 00	0006	0.147	
	09 00	0013	0.151	
73/07/07	09 35	0000	0.112	2.8
	09 35	0006	0.092	
	09 35	0016	0.085	
73/09/22	15 30	0000	0.104	2.3
	15 30	0005	0.130	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/04/27

450303
34 42 28.0 080 52 00.0 3
FISHING CREEK RESERVOIR
45023 SOUTH CAROLINA
030891

11EPALES 2111202
0017 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/04/02	09 20	0000	15.2		2	60	7.20	12	0.210	0.500	0.340	0.033
	09 20	0006	15.2	7.8		55	7.10	11	0.220	0.500	0.350	0.030
	09 20	0013	15.2	7.8		55	7.20	11	0.220	0.400	0.340	0.029
73/07/07	10 10	0000	27.9		12	118	6.80	20	0.220	0.800	0.410	0.070
	10 10	0006	27.8	5.6		118	6.70	21	0.270	0.500	0.400	0.065
	10 10	0015	27.7	6.4		118	6.80	20	0.240	0.500	0.430	0.071
73/09/22	15 45	0000	27.2	7.0	27	115	7.00	22	0.070	0.400	0.210	0.082
	15 45	0005	26.8	7.0		115	6.70	23	0.080	0.400	0.240	0.073

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/04/02	09 20	0000	0.133	2.5
	09 20	0006	0.149	
	09 20	0013	0.151	
73/07/07	10 10	0000	0.157	1.9
	10 10	0006	0.154	
	10 10	0015	0.173	
73/09/22	15 45	0000	0.118	2.0
	15 45	0005	0.099	

APPENDIX E

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/04/27

31<

4503A1
34 36 00.0 080 53 00.0 4
CATAWBA RIVER
45 7.5 GREAT FALLS
O/FISHING CREEK RES 030891
RT 97 BRDG BELO DAM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/02/18	09	35	0.294	0.560	0.160	0.066	0.160
73/03/10	11	25	0.290	0.440	0.072	0.058	0.145
73/04/08	10	15	0.290	0.500	0.052	0.048	0.140
73/05/22	10	30	0.240	1.150	0.115	0.048	0.120
73/06/10	13	20	0.320	3.900	0.470	0.067	0.145
73/07/15	09	55	0.270	0.885	0.173	0.053	0.125
73/08/12	11	05	0.240	0.230	0.110	0.050	0.125
73/09/20	11	00	0.220	0.830	0.176	0.048	0.130
73/10/21	10	00	0.420	0.750	0.160	0.132	0.210
73/11/10	14	10	0.490	4.900	0.400	0.132	0.190
73/12/19	13	30	0.360	1.200	0.232	0.140	0.200
74/01/13	10	00	0.440	1.100	0.140	0.084	0.160
74/01/31	12	30	0.384	0.700	0.088	0.072	0.190
74/02/19			0.384	1.000	0.150	0.085	0.210

STORET RETRIEVAL DATE 76/04/27

4503A2
34 42 30.0 080 52 30.0 4
CATAWBA RIVER
45 7.5 LANCASTER
I/FISHING CREEK RES 030891
ST RT 9 BRDG 1.5 MI W OF GRACE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/02/18	10	20	0.290	0.560	0.160	0.056	0.135
73/03/10	13	10	0.320	0.580	0.132	0.078	0.140
73/04/08	11	30	0.240	1.000	0.075	0.050	0.240
73/05/22	11	30	0.240	0.580	0.072	0.069	0.105
73/06/10	13	40	0.350	1.980	0.470	0.097	0.171
73/07/15	10	25	0.200	1.260	0.170	0.048	0.085
73/08/12	13	10	0.260	0.285	0.058	0.060	0.105
73/09/20	12	05	0.220	0.480	0.078		0.130
73/10/21	11	00	0.560	0.600	0.180	0.240	0.280
73/11/10	15	04	1.510	4.150	0.410	0.340	0.420
73/12/19	14	10	0.330	1.400	0.200	0.088	0.120
74/01/13	10	30	0.440	1.500	0.128	0.080	0.135
74/01/31	12	55	0.440	1.000	0.144	0.068	0.130
74/02/19			0.430	1.000	0.120	0.060	0.130

STORET RETRIEVAL DATE 76/04/27

33<

4503B1
34 42 00.0 080 52 30.0 4
UNNAMED CREEK
45 7.5 FORT LAWN
T/FISHING CREEK RES 030891
UNIMPROVED RD BRDG .25 MI SE FORT LAWN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/02/18	11 15		0.720	0.560	0.115	0.029	0.095
73/03/10	12 50		0.500	0.580	0.060	0.032	0.110
73/04/08	11 15		0.294	0.860	0.046	0.039	0.120
73/05/22	11 00		0.600	1.200	0.077	0.099	0.200
73/07/15	10 10		0.630	0.340	0.023	0.110	0.210
73/08/12	12 55		0.370	1.400	0.018	0.084	0.260
73/09/20	11 50		0.640	1.100	0.178	0.149	0.315
73/10/21	10 30		0.850	0.450	0.098	0.076	0.118
73/11/10	14 45		0.830	0.600	0.112	0.072	0.125
74/01/13	10 20		0.640	2.200	0.160	0.080	0.160
74/01/31	13 45		0.540	0.800	0.092	0.048	0.095
74/02/19	09 20		0.620	0.500	0.125	0.035	0.075

STORET RETRIEVAL DATE 76/04/27

4503C1
34 42 00.0 080 50 30.0 4
CANE CREEK
45 7.5 LANCASTER
T/FISHING CREEK RES 030891
RD BRDG 1 MI ABOVE CONFLU WITH RUM CREEK
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/02/18	08 15		0.150	0.750	0.198	0.100	0.195
73/03/10	10 45		0.132	0.880	0.160	0.058	0.140
73/04/08	09 50		0.147	1.380	0.082	0.056	0.140
73/05/22	10 10		0.310	0.790	0.126	0.115	0.210
73/06/10	12 50		0.154	4.300	0.460	0.044	0.375
73/07/15	09 00		0.570	1.800	0.350	0.140	0.220
73/08/12	10 45		0.350	2.400	0.965	0.305	0.420
73/09/20	10 45		0.570	2.000	0.880	0.336	0.490
73/10/21	09 40		0.900	3.100	2.300	0.870	1.200
73/11/10	13 50		0.330	3.200	1.680	1.300	1.800
73/12/19	13 05		0.224	1.000	0.330	0.152	0.240
74/01/13	09 45		0.340	1.300	0.294	0.138	0.300
74/01/31	13 15		0.156	0.900	0.080	0.068	0.165
74/02/19			0.232	1.000	0.145	0.090	0.183

STORET RETRIEVAL DATE 76/04/27

35<

450JD1
34 41 30.0 080 50 00.0 4
RUM CREEK
4S 7.5 LANCASTER
T/FISHING CREEK RES 030891
RO BRDG 1 MI ABOV CONFLU WITH CANE CREEK
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/02/18	09 05		0.120	0.690	0.260	0.042	0.070
73/03/10	10 50		0.084	0.480	0.048	0.048	0.095
73/04/08	10 00		0.078	1.760	0.154	0.042	0.095
73/05/22	10 20		0.168	0.800	0.094	0.088	0.140
73/06/10	12 55		0.078	3.700	0.350	0.054	0.150
73/07/15	09 35		0.090	0.360	0.091	0.036	0.065
73/08/12	10 50		0.067	0.650	0.061	0.035	0.065
73/09/20	12 20		0.054	0.560	0.052	0.052	0.120
73/10/21	09 45		0.010K	0.250	0.031	0.015	0.070
73/11/10	13 50		0.060	0.200	0.036	0.020	0.035
73/12/19	13 10		0.112	1.100	0.368		
74/01/13	09 50		0.104	0.800	0.136	0.064	0.110
74/01/31	15 18		0.100	0.600	0.068	0.056	0.095
74/02/19			0.132	0.500	0.070	0.045	0.085

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/04/27

4503CA AS4503CA P030000
34 43 09.0 080 48 13.0 4
LANCASTER
45 7.5 LANCASTER
T/FISHING CREEK RESERVOI 030891
BEAR CREEK/CANE CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/06/07	15 00								
CP(T)-			9.100	15.000	7.400	7.400	8.100	2.000	2.000
73/06/08	15 00								
73/10/11	08 30		7.700	19.000	13.700	10.200	10.200	1.500	2.000

STORET RETRIEVAL DATE 76/04/27

37<

4503XA AS4503XA P033000
34 59 20.0 080 59 30.0 4
ROCK HILL
45 15 ROCK HILL
T/FISHING CREEK RES 030891
MANCHESTER CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/06/04	00	00							
CP(T)-			1.600	15.000	2.160	5.550	7.450	11.000	10.000
73/06/04	02	00							
73/07/11	00	00							
CP(T)-			0.040	17.600	0.082	2.100	5.100	13.900	10.400
73/07/11	24	00							
73/08/01	00	00							
CP(T)-			0.140	18.000	0.058	4.900	18.000	11.400	10.000
73/08/01	24	00							
73/10/05	00	00							
CP(T)-			0.060	26.000	0.200	4.100	7.900	13.000	11.300
73/10/05	24	00							
73/11/06	00	00							
CP(T)-			0.050	16.500	0.096	2.510	4.500	12.800	11.500
73/11/06	24	00							
73/12/11			0.270	21.000	1.540	3.800	6.100	11.700	10.400
74/01/11			0.240	12.500	1.600		5.500	10.400	11.000
74/02/04								10.800	10.800
74/03/05			0.040	18.000	0.170	2.500	4.700	14.400	11.200
74/04/05			0.080	13.000	0.140	1.800	5.500	12.500	11.000
74/05/03			0.040	18.000	1.450	1.900	5.600	12.600	10.600
74/06/04			0.120	19.000	0.050K	2.000	4.400	12.800	11.300
74/07/17			0.080	19.000	0.094	3.730	5.000	11.200	11.500

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/04/27

4503ZA P04503ZA P003637
35 01 05.0 080 56 30.0 4
FORT MILL (JACKSON)
45 7.5 FORT MILL
T/FISHING CREEK RES 030891
STEELE CREEK/CATAWBA RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/06/26 CP(T)- 73/06/28	08 00 16 30		0.175	20.000	1.600	2.200	7.100	0.800	

STORET RETRIEVAL DATE 75/04/27

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4503ZB IP4503ZB P000744
35 01 05.0 080 56 30.0 4
FORT MILL (IMHOFF #2)
45 7.5 FORT MILL
T/FISHING CREEK RES 030891
STEELE CREEK/CATAWBA RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/06/28	08 15								
CP(T)-			0.100	17.000	8.000	3.700	6.000	0.125	0.144
73/06/28	16 25								

STORET RETRIEVAL DATE 76/04/27

4503ZC IP4503ZC P000154
35 01 05.0 080 56 30.0 4
FORT MILL (IMHOFF #3)
45 7.5 FORT MILL
T/FISHING CREEK RES 030891
STEELE CREEK/CATAWBA RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/06/28 CP(T)- 73/06/28	08 30 16 35		0.060	37.800	24.400	8.200	10.500	0.060	0.060